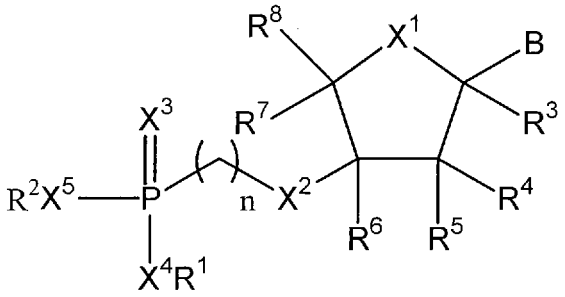
AMENDMENTS TO THE CLAIMS

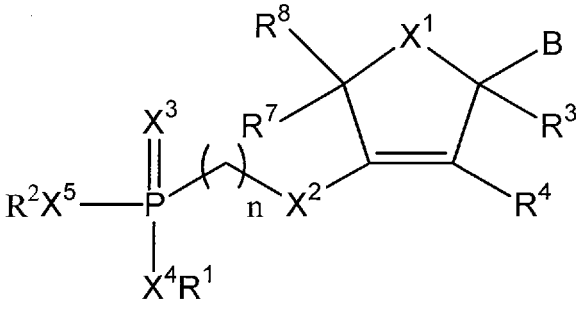
The following listing of claims replaces, without prejudice, all prior versions and listings of claims in this application.

1-13. (Canceled)

14. (Currently amended) A compound ~~including a heterocyclic nucleobase attached to a first carbon atom of an optionally substituted five-member saturated or mono-unsaturated heterocyclic group selected from tetrahydrofuranyl, tetrahydrothienyl, dihydrofuranyl and dihydrothienyl and further including a phosphonoalkoxy or phosphonothioalkyl group attached to a second carbon atom of said five-member saturated or mono-unsturated heterocyclic group, said first carbon atom being adjacent to the heteroatom of said five-member saturated or mono-unsturated heterocyclic group, and said second carbon atom being adjacent neither to the heteroatom nor to the first carbon atom of said five-member saturated or mono-unsturated heterocyclic group, said compound being~~ represented by one of the general formulae (II) and (XIX):



(II), and



(XIX)

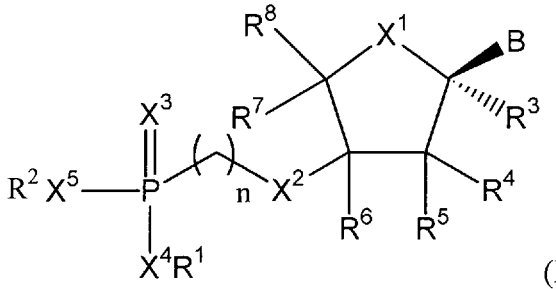
wherein:

- X^1, X^2, X^3, X^4 and X^5 are each an atom ~~each~~ independently selected from the group consisting of oxygen and sulfur,
- B is a natural or non-natural heterocyclic nucleobase,
- R^1 and R^2 are each independently selected from the group consisting of hydrogen; (-PO_3R^{16})$_m$-$PO_3R^{17}R^{18}$; alkyl; alkenyl; alkynyl; cycloalkyl; cycloalkenyl; cycloalkynyl; aryl; arylalkyl; heterocyclic; heterocyclic-alkyl; acyloxyalkyl; acyloxyalkenyl; acyloxyalkynyl; acyloxyaryl; acyloxyarylalkyl; acyloxyarylalkenyl; acyloxyarylalkynyl; ~~dialkylcarbonate~~ dialkylcarbonato; ~~alkylarylcarbonate~~ alkylarylcarbonato; ~~alkylalkenylcarbonate~~ alkylalkenylcarbonato; ~~alkylalkynylcarbonate~~ alkylalkynylcarbonato; ~~alkenylarylcarbonate~~ alkenylarylcarbonato; ~~alkynylarylcarbonate~~ alkynylarylcarbonato; ~~alkenylalkynylcarbonate~~ alkenylalkynylcarbonato; ~~dialkenylcarbonate~~ dialkenylcarbonato; ~~dialkynylcarbonate~~ dialkynylcarbonato; wherein said alkyl, alkenyl and alkynyl optionally contains one or more heteroatoms in ~~or at the end of~~ the hydrocarbon chain, said heteroatoms being independently selected from the group consisting of oxygen and sulfur and NH ~~and nitrogen~~;
- ~~R^3~~, R^4, R^5 and R^6, ~~R^7 and R^8~~ are each independently selected from the group consisting of hydrogen, azido, halogen, cyano, alkyl, alkenyl, alkynyl, SR^{14} and OR^{14};
- R^3, R^7 and R^8 are each hydrogen;
- R^{14} is selected from the group consisting of hydrogen; alkyl; alkenyl; alkynyl; cycloalkyl; cycloalkenyl; cycloalkynyl; aryl; heterocyclic; arylalkyl; heterocyclic-alkyl; and acyloxyalkyl; wherein said alkyl, alkenyl and alkynyl optionally contain one or more heteroatoms in ~~or at the end of~~ the hydrocarbon chain, said heteroatoms being independently selected from the group consisting of oxygen and sulfur ~~and nitrogen~~;
- R^{16}, R^{17} and R^{18} are independently selected from the group consisting of hydrogen; alkyl; alkenyl; alkynyl; cycloalkyl; cycloalkenyl; cycloalkynyl; aryl; arylalkyl; heterocyclic ring; heterocyclic ring-alkyl; acyloxyalkyl; wherein said alkyl, alkenyl and alkynyl optionally contain one or more heteroatoms in ~~or at the end of~~ the hydrocarbon chain, said heteroatoms being independently selected from the group consisting of oxygen and sulfur ~~and nitrogen~~;
- X^4 and R^1, or X^5 and R^2, may together form an amino-acid residue or polypeptide wherein a carboxyl function of said amino-acid residue being at a distance from the amidate nitrogen not further than 5 atoms is esterified;

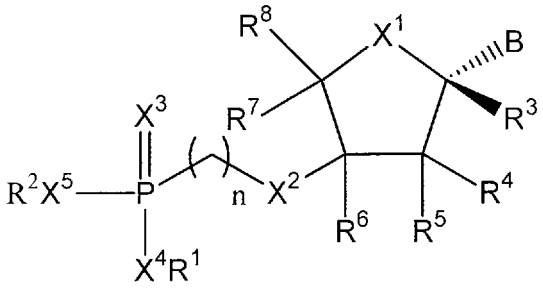
- X^4 and R^1, or X^5 and R^2, may together form a group having the formula – $OC(R^9)_2OC(O)Y(R^{10})_a$ wherein Y = N or O, a = 1 when Y is O, and a = 1 or 2 when Y is N;
- R^9 is selected from the group consisting of hydrogen, alkyl, aryl, alkenyl, alkynyl, alkenylaryl, alkynylaryl ~~or~~ and alkylaryl, wherein each of said alkyl, alkenyl, alkynyl and aryl groups is optionally substituted with one or more atoms or groups selected from the group consisting of halo, cyano, azido, nitro and OR^{14};
- R^{10} is selected from the group consisting of hydrogen, alkyl, aryl, alkenyl, alkynyl, alkenylaryl, alkynylaryl and alkylaryl, wherein each of said alkyl, alkenyl, alkynyl and aryl groups is optionally substituted with one or more atoms or groups selected from the group consisting of halo, cyano, azido, nitro, OR^{14} and $NR^{11}R^{12}$;
- R^{11} and R^{12} are each independently selected from the group consisting of hydrogen and alkyl,
- provided that at least one of R^{11} and R^{12} is not hydrogen;
- n is an integer representing the number of methylene groups between X_2 and P, each of said methylene groups being optionally and independently substituted with one or two substituents selected from the group consisting of halogen, hydroxyl, sulhydryl and C_{1-4} alkyl, and n being selected from 1, 2, 3, 4, 5 and 6; and
- m is 0 or 1,

including pharmaceutically acceptable salts, solvates, and stereoisomers ~~and prodrugs~~ thereof.

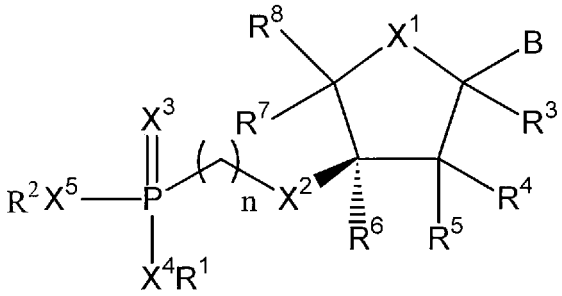
15. (Currently amended) ~~A~~ The compound ~~according to~~ of claim 14, being represented by one of the general formulae (III) to (XVIII):



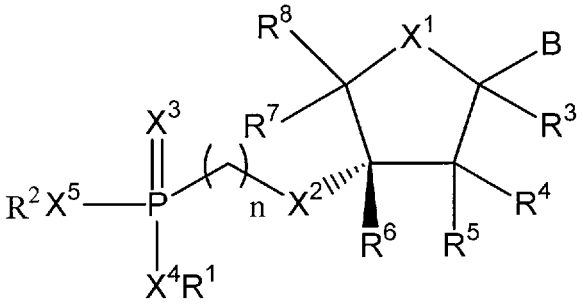
(III),



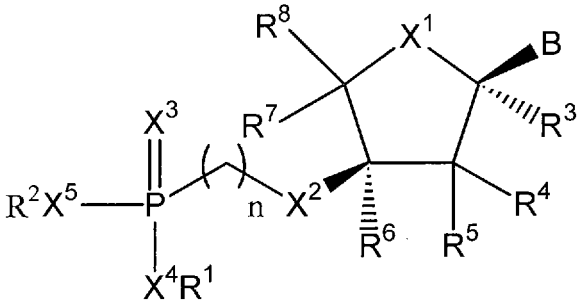
(IV),



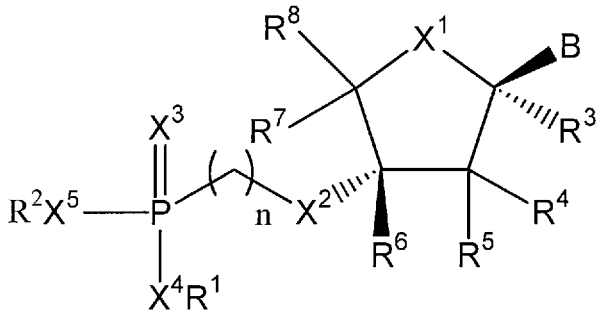
(V),



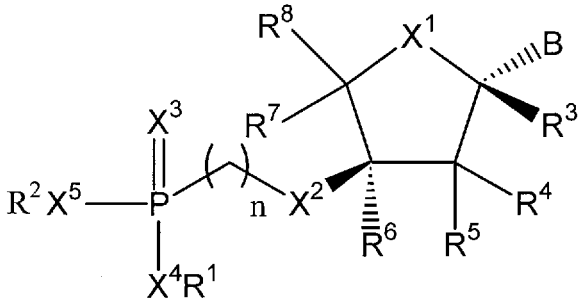
(VI),



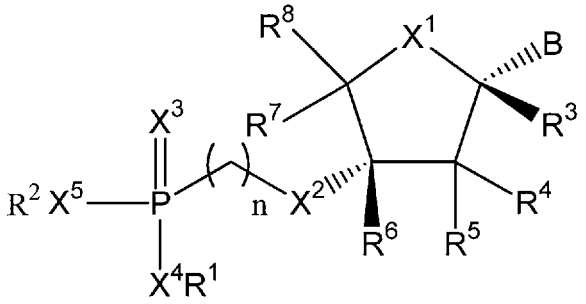
(VII),



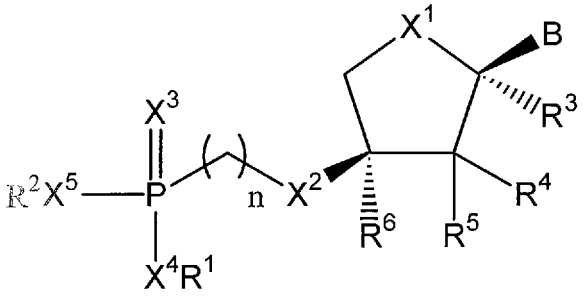
(VIII),



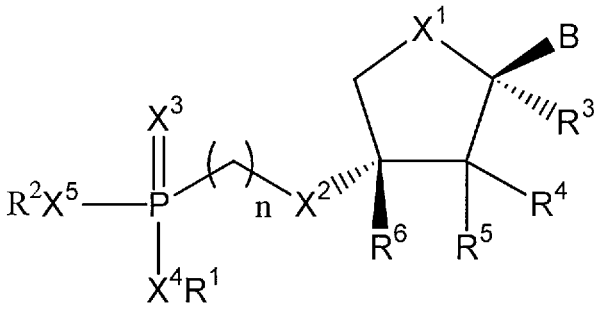
(IX),



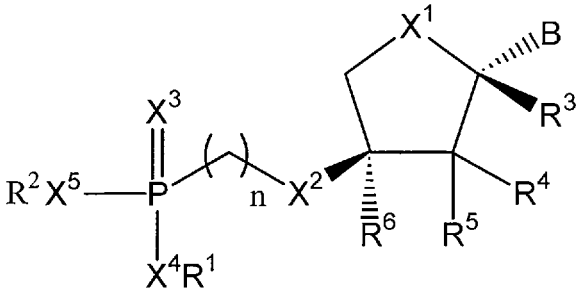
(X),



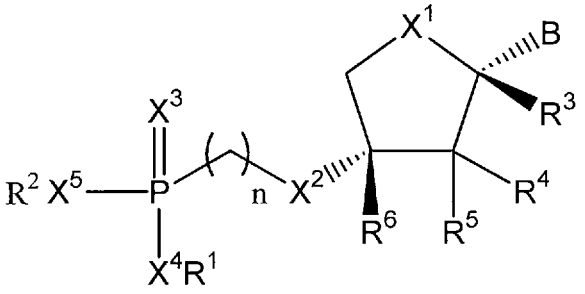
(XI),



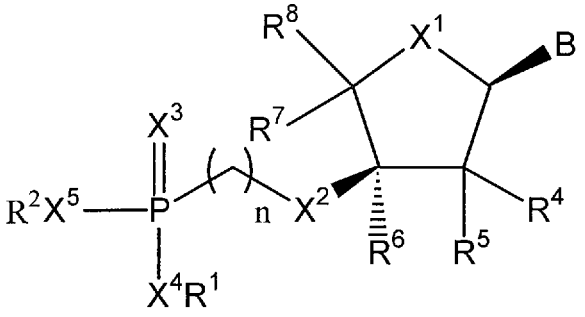
(XII)



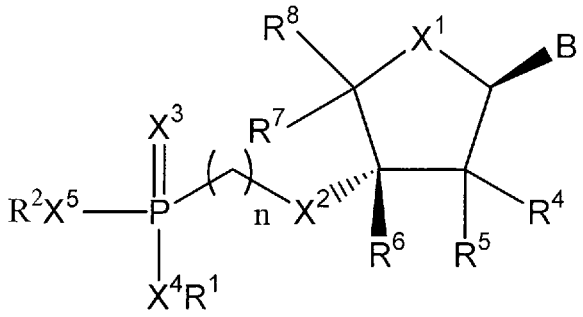
(XIII)



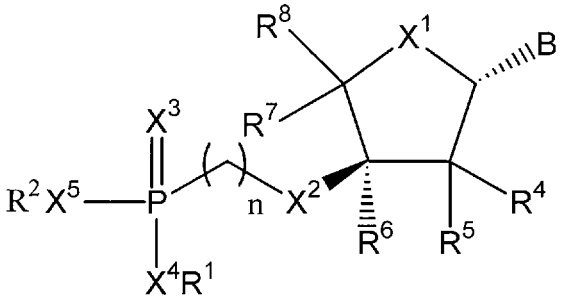
(XIV),



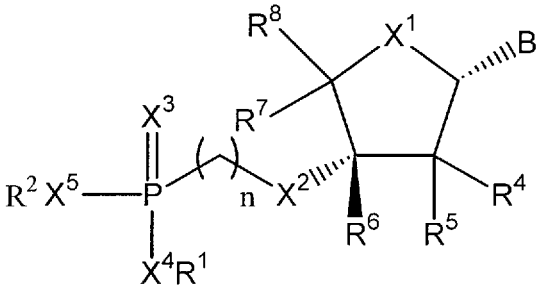
(XV),



(XVI)



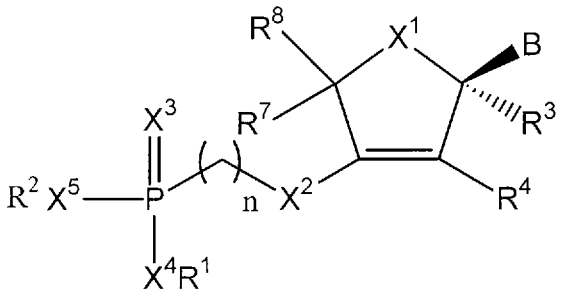
(XVII), and



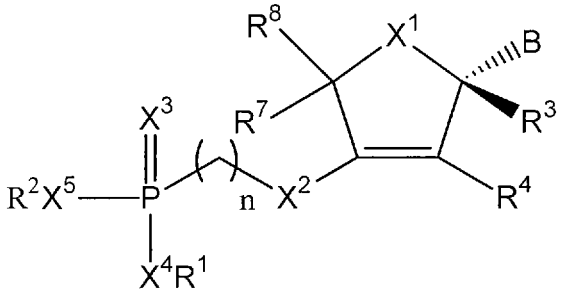
(XVIII)

wherein n, m, B, X^1, X^2, X^3, X^4, X^5, R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11}, R^{12}, R^{14}, R^{16}, R^{17} and R^{18} are defined as in formula (II), including pharmaceutically acceptable salts, solvates, and stereoisomers ~~and prodrugs~~ thereof.

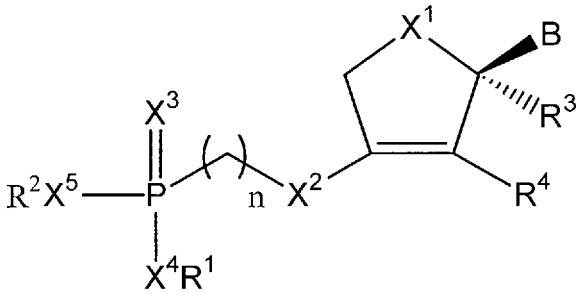
16. (Currently amended) ~~A~~ The compound ~~according to~~ of claim 14, being represented by any of the following formulae (XX) to (XXVI):



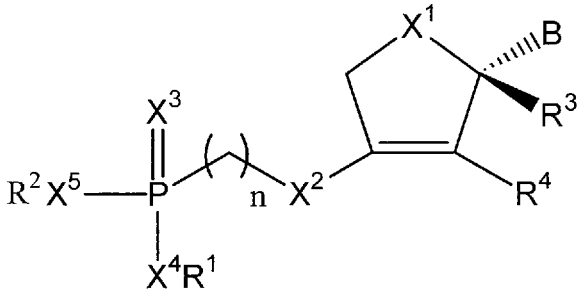
(XX),



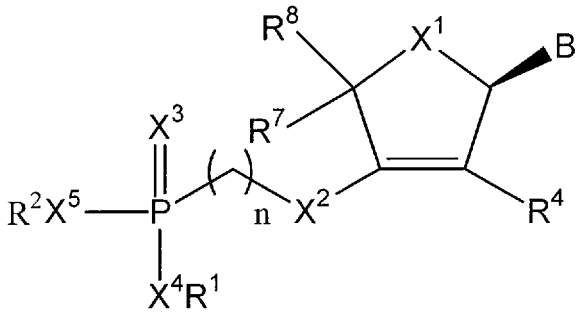
(XXI),



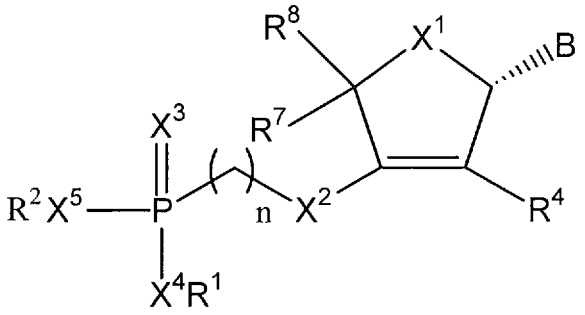
(XXII),



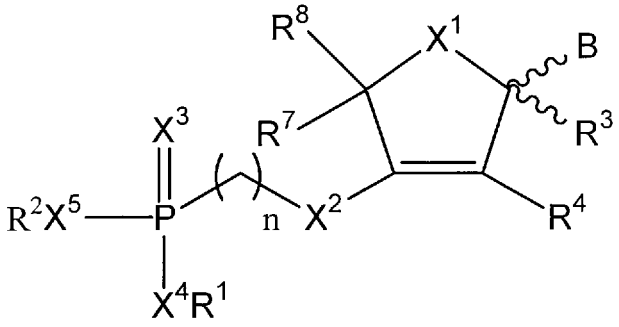
(XXIII),



(XXIV),



(XXV), and



(XXVI),

wherein n, m, B, X^1, X^2, X^3, X^4, X^5, R^1, R^2, R^3, R^4, R^7, R^8, R^9, R^{10}, R^{11}, R^{12}, R^{14}, R^{16}, R^{17} and R^{18} are defined as in formula ~~(II)~~ (XIX), including pharmaceutically acceptable salts, solvates, and stereoisomers ~~and prodrugs~~ thereof.

17. (Currently amended) ~~A~~ The compound ~~according to~~ of claim 14, wherein B is selected from the group consisting of hypoxanthine, guanine, adenine, cytosine, ~~inosine,~~ thymine, uracil, xanthine; 2,6-diaminopurine; 8-aza derivatives of 2-aminopurine, 2,6-diaminopurine, 2-amino-6-chloropurine, hypoxanthine~~, inosine~~ and xanthine wherein the heterocyclic ring is substituted with one or more substituents independently selected from the group consisting of

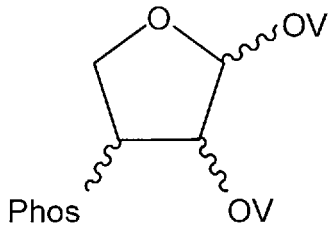
halogen, hydroxyl, amino and C_{1-6} alkyl; 7-deaza-8-aza derivatives of adenine, guanine, 2-aminopurine, 2,6-diaminopurine, 2-amino-6-chloropurine, hypoxanthine~~, inosine~~ and xanthine wherein the heterocyclic ring is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxyl, amino and C_{1-6} alkyl; 1-deaza derivatives of 2-aminopurine, 2,6-diaminopurine, 2-amino-6-chloropurine, hypoxanthine~~, inosine~~ and xanthine wherein the heterocyclic ring is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxyl, amino and C_{1-6} alkyl; 7-deaza derivatives of 2-aminopurine, 2,6-diaminopurine, 2-amino-6-chloropurine, hypoxanthine~~, inosine~~ and xanthine wherein the heterocyclic ring is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxyl, amino and C_{1-6} alkyl; 3-deaza derivatives of 2-aminopurine, 2,6-diaminopurine, 2-amino-6-chloropurine, hypoxanthine~~, inosine~~ and xanthine wherein the heterocyclic ring is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxyl, amino and C_{1-6} alkyl; 6-azacytosine; 5-fluorocytosine; 5-chlorocytosine; 5-iodocytosine; 5-bromocytosine; 5-methylcytosine; 5-bromovinyluracil; 5-fluorouracil; 5-chlorouracil; 5-iodouracil; 5-bromouracil; 5-trifluoromethyluracil; 5-methoxymethyluracil; 5-ethynyluracil and 5-propynyluracil.

18. (Currently amended) ~~A~~ The compound ~~according to~~ of claim 15, wherein B is selected from the group consisting of hypoxanthine, guanine, adenine, cytosine~~, inosine~~, thymine, uracil, xanthine; 2,6-diaminopurine; 8-aza derivatives of 2-aminopurine, 2,6-diaminopurine, 2-amino-6-chloropurine, hypoxanthine~~, inosine~~ and xanthine wherein the heterocyclic ring is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxyl, amino and C_{1-6} alkyl; 7-deaza-8-aza derivatives of adenine, guanine, 2-aminopurine, 2,6-diaminopurine, 2-amino-6-chloropurine, hypoxanthine~~, inosine~~ and xanthine wherein the heterocyclic ring is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxyl, amino and C_{1-6} alkyl; 1-deaza derivatives of 2-aminopurine, 2,6-diaminopurine, 2-amino-6-chloropurine, hypoxanthine~~, inosine~~ and xanthine wherein the heterocyclic ring is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxyl, amino and C_{1-6} alkyl; 7-deaza derivatives of 2-aminopurine, 2,6-diaminopurine, 2-amino-6-chloropurine, hypoxanthine~~, inosine~~ and xanthine

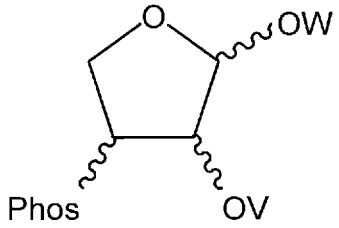
wherein the heterocyclic ring is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxyl, amino and C_{1-6} alkyl; 3-deaza derivatives of 2-aminopurine, 2,6-diaminopurine, 2-amino-6-chloropurine, hypoxanthine~~, inosine~~ and xanthine wherein the heterocyclic ring is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxyl, amino and C_{1-6} alkyl; 6-azacytosine; 5-fluorocytosine; 5-chlorocytosine; 5-iodocytosine; 5-bromocytosine; 5-methylcytosine; 5-bromovinyluracil; 5-fluorouracil; 5-chlorouracil; 5-iodouracil; 5-bromouracil; 5-trifluoromethyluracil; 5-methoxymethyluracil; 5-ethynyluracil and 5-propynyluracil.

19. (Currently amended) ~~A~~ The compound ~~according to~~ of claim 16, wherein B is selected from the group consisting of hypoxanthine, guanine, adenine, cytosine~~, inosine~~, thymine, uracil, xanthine; 2,6-diaminopurine; 8-aza derivatives of 2-aminopurine, 2,6-diaminopurine, 2-amino-6-chloropurine, hypoxanthine~~, inosine~~ and xanthine wherein the heterocyclic ring is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxyl, amino and C_{1-6} alkyl; 7-deaza-8-aza derivatives of adenine, guanine, 2-aminopurine, 2,6-diaminopurine, 2-amino-6-chloropurine, hypoxanthine~~, inosine~~ and xanthine wherein the heterocyclic ring is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxyl, amino and C_{1-6} alkyl; 1-deaza derivatives of 2-aminopurine, 2,6-diaminopurine, 2-amino-6-chloropurine, hypoxanthine~~, inosine~~ and xanthine wherein the heterocyclic ring is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxyl, amino and C_{1-6} alkyl; 7-deaza derivatives of 2-aminopurine, 2,6-diaminopurine, 2-amino-6-chloropurine, hypoxanthine~~, inosine~~ and xanthine wherein the heterocyclic ring is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxyl, amino and C_{1-6} alkyl; 3-deaza derivatives of 2-aminopurine, 2,6-diaminopurine, 2-amino-6-chloropurine, hypoxanthine~~, inosine~~ and xanthine wherein the heterocyclic ring is substituted with one or more substituents independently selected from the group consisting of halogen, hydroxyl, amino and C_{1-6} alkyl; 6-azacytosine; 5-fluorocytosine; 5-chlorocytosine; 5-iodocytosine; 5-bromocytosine; 5-methylcytosine; 5-bromovinyluracil; 5-fluorouracil; 5-chlorouracil; 5-iodouracil; 5-bromouracil; 5-trifluoromethyluracil; 5-methoxymethyluracil; 5-ethynyluracil and 5-propynyluracil.

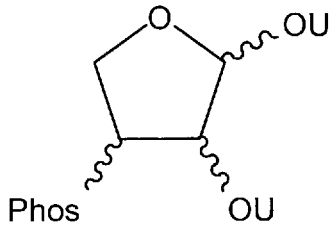
20. (Previously presented) A compound represented by one of the following general formulae (XXXI) to (XXXVI):



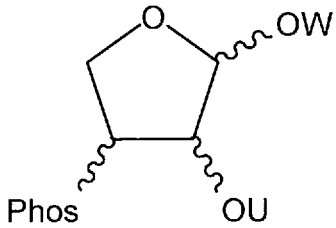
(XXXI),



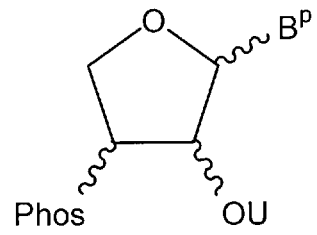
(XXXII),



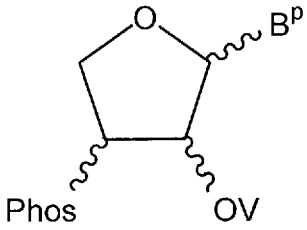
(XXXIII),



(XXXIV),



(XXXV), and



(XXXVI),

wherein:

- U is an acyl group,
- V is a silyl group,
- W is an alkyl group,
- the snake-like symbol means any stereochemical arrangement of the respective bond,
- B^p is an optionally protected heterocyclic nucleobase, and
- Phos is an O-protected phosphonoalkoxy group or phosphonothioalkyl group.

21. (Currently amended) ~~A~~ The compound ~~according to~~ of claim 14, being selected from the group consisting of:

1-(N^6-benzoyladenin-9-yl)-2-O-benzoyl-3-O-(diisopropylphosphonomethyl)-L-threofuranose (**11**);

1-(thymin-1-yl)-2-O-benzoyl-3-O-(diisopropylphosphonomethyl)-L-threofuranose(**12**);

1-(uracil-1-yl)-2-O-benzoyl-3-O-(diisopropylphosphonomethyl)-L-threofuranose (**13**);

1-(N^4-acetylcytosin-1-yl)-2-O-benzoyl-3-O-(diisopropylphosphonomethyl)-L-threofuranose (**14**);

1-(adenin-9-yl)-3-O-(diisopropylphosphonomethyl)-L-threofuranose (**15**);

1-(thymin-1-yl)-3-O-(diisopropylphosphonomethyl)-L-threofuranose (**16**);

1-(uracil-1-yl)-3-O-(diisopropylphosphonomethyl)-L-threofuranose (**17**);

1-(cytosin-1-yl)-3-O-(diisopropylphosphonomethyl)-L-threofuranose (**18**);

1-(adenin-9-yl)-2-deoxy-3-O-(diisopropylphosphonomethyl)-L-threofuranose (**19**);

1-(thymin-1-yl)-2-deoxy-3-O-(diisopropylphosphonomethyl)-L-threofuranose (**20**);

1-(uracil-1-yl)-2-deoxy-3-O-(diisopropylphosphonomethyl)-L-threofuranose (**21**);

1-(cytosin-1-yl)-2-deoxy-3-O-(diisopropylphosphonomethyl)-L-threofuranose (**22**);

1-(adenin-9-yl)-3-O-(phosphonomethyl)-L-threofuranose sodium salt (**3a**);

1-(thymin-1-yl)-3-O-(phosphonomethyl)-L-threofuranose sodium salt (**3b**);

1-(uracil-1-yl)-3-O-(phosphonomethyl)-L-threofuranose sodium salt (**3c**);

1-(cytosin-1-yl)-3-O-(phosphonomethyl)-L-threofuranose sodium salt (**3d**);

1-(adenin-1-yl)-2-deoxy-3-O-(phosphonomethyl)-L-threofuranose sodium salt (**3e**);

1-(thymin-1-yl)-2-deoxy-3-O-(phosphonomethyl)-L-threofuranose sodium salt (**3f**);

1-(uracil-1-yl)-2-deoxy-3-O-(phosphonomethyl)-L-threofuranose sodium salt (**3g**); and

1-(cytidin-1-yl)-2-deoxy-3-O-(phosphonomethyl)-L-threofuranose sodium salt (**3h**);

or a pharmaceutically acceptable salt , an stereoisomer, a solvate or a pro-drug thereof.

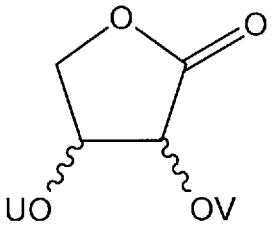
22. (Currently amended) A method of ~~prevention or~~ treatment of a viral infection in a mammal in need thereof comprising the administration of a compound according to claim 14.

23. (Currently amended) A method of ~~prevention or~~ treatment of an infection by the Human Immunodeficiency Virus (HIV) in a host in need thereof comprising the administration of a compound according to claim 14.

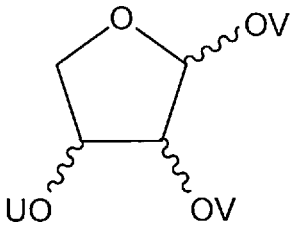
24. (Previously presented) A pharmaceutical composition comprising a compound according to claim 14 as an active ingredient in admixture with at least a pharmaceutically acceptable carrier.

25. (Currently amended) A pharmaceutical composition comprising a compound according to claim 14 as an active ingredient in admixture with at least a pharmaceutically acceptable carrier, and further comprising ~~an antiviral agent~~ a retroviral enzyme inhibitor.

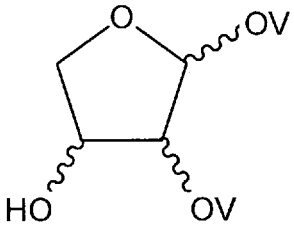
26. (Previously presented) A compound represented by one of the following general formulae (XXVIII) to (XXX):



(XXVIII),



(XXIX), and



(XXX),

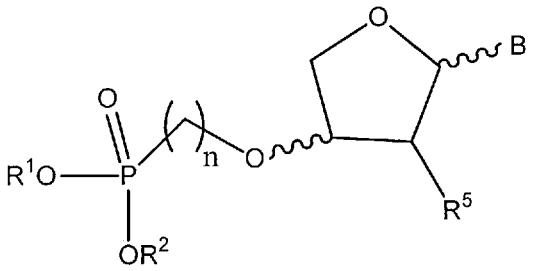
wherein:

- U is an acyl group,
- V is a silyl group, and

- the snake-like symbol means any stereochemical arrangement of the respective bond.

27. (New) The compound of claim 26, being 2-O-tributyldimethylsilyl-3-O-benzoyl-L-threonolactone.

28. (New) A furanose nucleoside represented by the general formula (I):



(I)

wherein:

- B is a heterocycle selected from the group consisting of pyrimidine and purine bases;
- the snake-like symbol means any stereochemical arrangement of the bond linking B, or the phosphonalkoxy group, to the furanyl group.
- R^1 and R^2 are each independently selected from the group consisting of hydrogen; (-PO_3R^{16})$_m$-$PO_3R^{17}R^{18}$; alkyl; alkenyl; alkynyl; cycloalkyl; cycloalkenyl; cycloalkynyl; aryl; arylalkyl; heterocyclic ring; heterocyclic ring-alkyl; acyloxyalkyl; acyloxyalkenyl; acyloxyalkynyl; acyloxyaryl; acyloxyarylalkyl; acyloxyarylalkenyl; acyloxyarylalkynyl; dialkylcarbonato; alkylarylcarbonato; alkylalkenylcarbonato; alkylalkynylcarbonato; alkenylarylcarbonato; alkynylarylcarbonato; alkenylalkynylcarbonato; dialkenylcarbonato; dialkynylcarbonato; wherein said alkyl, alkenyl and alkynyl can contain a heteroatom in the hydrocarbon chain, said heteroatom being selected from the group consisting of oxygen, sulfur and NH;
- R^5 is selected from the group consisting of hydrogen, azido, halogen, cyano, alkyl, alkenyl, alkynyl, SR^{14} and OR^{14};
- R^{14} is selected from the group consisting of hydrogen; alkyl; alkenyl; alkynyl; cycloalkyl; cycloalkenyl; cycloalkynyl; aryl; heterocyclic; arylalkyl; heterocyclic-alkyl and acyloxyalkyl;

wherein said alkyl, alkenyl and alkynyl can contain a heteroatom in the hydrocarbon chain, said heteroatom being selected from the group consisting of oxygen, sulfur and NH;

- R^{16}, R^{17} and R^{18} are independently selected from the group consisting of hydrogen; alkyl; alkenyl; alkynyl; cycloalkyl; cycloalkenyl; cycloalkynyl; aryl; arylalkyl; heterocyclic; heterocyclic-alkyl and acyloxyalkyl; wherein said alkyl, alkenyl and alkynyl can contain a heteroatom in the hydrocarbon chain, said heteroatom being selected from the group consisting of oxygen, sulfur and NH;
- n is an integer selected from 1, 2, 3, 4, 5 or 6;
- m is 0 or 1,

including pharmaceutically acceptable salts, solvates, and stereoisomers thereof.

29. (New) The furanose nucleosides of claim 28, wherein B is adenine or thymine.